

## < WORKSHEET

### Chemistry

#### ATTEMPTED MCQS 0/31

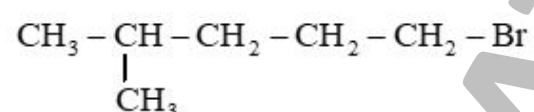


- 1) The type of alkyl halides in which halogen is attached with such C-atom which is further attached with two C-atoms are called?

A) 1° alkyl halides                      C) 3° alkyl halides  
B) 2° alkyl halides                      D) 4° alkyl halides

☐ A    ☐ B    ☐ C    ☐ D

- 2) Consider the following structure formula of alkyl halide:



The correct name according to IUPAC is:

A) 1-Bromo-4-methylpentane  
B) 2-Methyl-5-bromopentane  
C) 2-Methyl-1-bromopentane  
D) 2-Methyl-2-bromopentane

☐ A    ☐ B    ☐ C    ☐ D

- 3) Which of the following is the best method to prepare alkyl halides?

A) Reaction of alcohol with HCl in the presence of catalyst  $\text{ZnCl}_2$   
B) Reaction of alcohol with  $\text{PCl}_5$   
C) Reaction of alcohol with  $\text{PCl}_3$   
D) Reaction of alcohol with  $\text{SOCl}_2$  in the presence of pyridine solvent

☐ A    ☐ B    ☐ C    ☐ D

- 4) Which of the following alkyl halides cannot be prepared by the direct halogenation of alkanes?

A)  $\text{R} - \text{Cl}$                                   C)  $\text{R} - \text{I}$   
B)  $\text{R} - \text{Br}$                                   D)  $\text{R} - \text{F}$

☐ A    ☐ B    ☐ C    ☐ D

5) Which of the following is good leaving group?

- A)  $\text{NH}_2^-$                       C)  $\text{OR}^-$   
B)  $\text{HSO}_4^-$                     D)  $\text{OH}^-$

☐ A    ☐ B    ☐ C    ☐ D

6) Which of the following statements is not correct for  $\text{S}_{\text{N}}2$  mechanism reaction?

- A) It is bimolecular, 2<sup>nd</sup> order reaction  
B) Order of ease of  $\text{S}_{\text{N}}2$  mechanism in alkyl halide is 1° alkyl halide > 2° alkyl halide > 3° alkyl halide  
C) It takes place in the presence of polar solvent  
D) It involves 100% inversion in the products

☐ A    ☐ B    ☐ C    ☐ D

7) Mark the incorrect statement about alkyl halide:

- A) Boiling points of haloalkanes are greater than that of alkanes  
B) Order of decreasing boiling points in alkyl halides is  $\text{R}-\text{I} > \text{R}-\text{Br} > \text{R}-\text{Cl} > \text{R}-\text{F}$   
C) Alkyl halides are soluble in water  
D) Primary alkyl halides can be prepared by reaction of  $\text{PCl}_5$  or  $\text{SOCl}_2$  with alcohols but not aryl halide

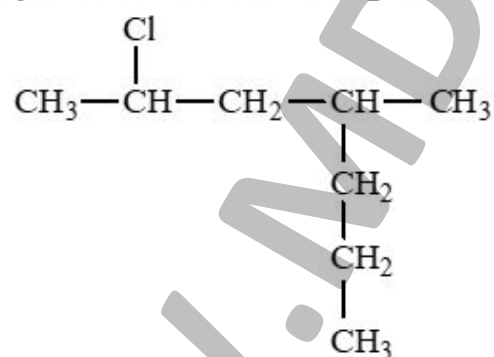
☐ A    ☐ B    ☐ C    ☐ D

8) Which of the following halide ion ( $\text{X}^-$ ) is good nucleophile and good leaving group?

- A)  $\text{I}^-$                               C)  $\text{F}^-$   
B)  $\text{Cl}^-$                             D)  $\text{Br}^-$

☐ A    ☐ B    ☐ C    ☐ D

9) Which one of the following is the correct name according to IUPAC system for the formula given below?



- A) 4-Methyl-6-chloroheptane  
B) 2-Chloro-4-methylheptane  
C) 2-Chloro-4-n propylhexane  
D) 2-Chloro-4-n propylpentane

☐ A    ☐ B    ☐ C    ☐ D

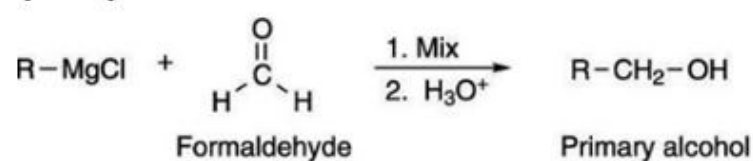
10)  $\text{CCl}_4$  has all of the following characteristic features EXCEPT:

- A) It is colourless liquid  
B) It is used as industrial solvent  
C) It is insoluble in water and soluble in alcohol for fat, oil etc  
D) It is inflammable

☐ A    ☐ B    ☐ C    ☐ D

11) Considered the following reaction of Grignard reagent with methanal (a carbonyl compound) followed by

**hydrolysis:**



**The mechanism of reaction before hydrolysis is:**

- A) Electrophilic addition reaction
- B)  $\beta$ -elimination
- C) Nucleophilic addition reaction
- D) Nucleophilic substitution reaction

☐ A    ☐ B    ☐ C    ☐ D

**12) Which of the following type of alkyl halide is the most reactive w.r.t  $\text{S}_{\text{N}}1$ .**

- A)  $\text{R-X}$
- B)  $\begin{array}{c} \text{R} \\ | \\ \text{R}-\text{C}-\text{X} \\ | \\ \text{R} \end{array}$
- C)  $\text{R-CH}_2\text{-X}$
- D)  $\begin{array}{c} \text{R} \\ | \\ \text{R}-\text{CH}-\text{X} \end{array}$

☐ A    ☐ B    ☐ C    ☐ D

**13) Alkyl halides are considered to be very reactive compounds towards nucleophiles because:**

- A) They have an electrophilic carbon
- B) They have an electrophilic carbon and a good leaving group
- C) They have an electrophilic carbon and bad leaving group
- D) They have a nucleophilic carbon and a good leaving group

☐ A    ☐ B    ☐ C    ☐ D

**14) Which one of the followings is Halothane?**

- A)  $\begin{array}{cc} \text{H} & \text{Cl} \\ | & | \\ \text{H}-\text{C} & -\text{C}-\text{H} \\ | & | \\ \text{Cl} & \text{H} \end{array}$
- B)  $\begin{array}{cc} \text{F} & \text{H} \\ | & | \\ \text{F}-\text{C} & -\text{C}-\text{Cl} \\ | & | \\ \text{F} & \text{Br} \end{array}$
- C)  $\begin{array}{ccc} \text{H} & \text{H} & \text{Br} \\ | & | & | \\ \text{H}-\text{C} & -\text{C}- & \text{C}-\text{H} \\ | & | & | \\ \text{Cl} & \text{H} & \text{H} \end{array}$
- D)  $\begin{array}{cc} \text{H} & \text{Br} \\ | & | \\ \text{H}-\text{C} & -\text{C}-\text{H} \\ | & | \\ \text{Br} & \text{H} \end{array}$

☐ A    ☐ B    ☐ C    ☐ D

**15) Identify the incorrect statement about the use of chloroform:**

- A) It is used as an anesthetic substance
- B) It is used as a solvent for fats waxes and resins
- C) It is used in manufacturing freons
- D) It is used as preservative for anatomical specimen

☐ A    ☐ B    ☐ C    ☐ D

**16) All of the following are characteristic features of Teflon plastic EXCEPT:**

- A) It is valuable plastic which resists the action of acid and alkali



- B) It is used as coating the electrical wiring  
C) It is used as a non-stick coating for cooking pans  
D) It reacts with oxidants

☐ A ☐ B ☐ C ☐ D

**17) Which of the following is the most dangerous factor which damages ozone?**

- A) Aerosol spray  
B) Use of chlorofluorocarbons  
C) Effect of  $\text{SO}_2$  and  $\text{NO}_2$  pollutant  
D) Global warming by  $\text{CO}_2$

☐ A ☐ B ☐ C ☐ D

**18) Grignard reagent is reactive due to:**

- A) The presence of halogen atom  
B) The polarity of C – Mg bond  
C) The presence of Mg atom  
D) The polarity of C – X bond

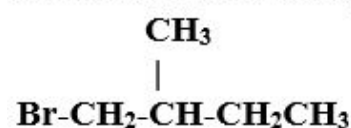
☐ A ☐ B ☐ C ☐ D

**19) In which of the following reactions alcohol is produced?**

- A) Reaction of alkyl halide with aqueous KOH  
B) Reaction of alkyl halide with alcoholic KOH  
C) Reaction of alkyl halide with KCN followed by acidic hydrolysis  
D) Reactions of alkyl halide with sodium alkoxide

☐ A ☐ B ☐ C ☐ D

**20) Consider the following structure of alkyl halide:**

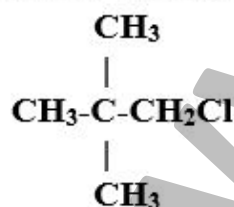


**Which of the following correct name of given structure according to IUPAC system is:**

- A) 1-Bromo-2-methylbutane    C) 4-Bromo-2-methylbutane  
B) 4-Bromo-3-methylbutane    D) 1-Bromo-3-methylbutane

☐ A ☐ B ☐ C ☐ D

**21) Consider the following structure of alkyl halide:**



**Which of the following correct name of given structure according to IUPAC system is:**

- A) 3-Chloro-2,2-dimethylpropane  
B) 1-Chloro-2,2-dimethylpropane  
C) 2-Chloro-2,2-dimethylpropane  
D) 1-Chloro-2,3-dimethylpropane

☐ A ☐ B ☐ C ☐ D

**22) Which of the following correct statement about substrate and leaving group?**

- A) The molecule which undergoes nucleophilic substitution reaction is called substrate

B) The group are species which leaves the substrate is called leaving group (nucleofuge)

C) Both A and B

D) Neither A nor B

☐ A ☐ B ☐ C ☐ D

23) Which of the following carbocation is most stable?

- A)  $(\text{CH}_3)_3\text{C}-\text{C}^+\text{H}_2$  C)  $\text{CH}_3\text{CH}_2\text{C}^+\text{H}_2$   
B)  $(\text{CH}_3)_3\text{C}^+$  D)  $\text{CH}_3\text{C}^+\text{HCH}_2\text{CH}_3$

☐ A ☐ B ☐ C ☐ D

24) Which one of the following is a correct statement about the two alkenes

$\text{CH}_3-\text{CH}_2-\text{CH}=\text{CH}_2$  and  $\text{CH}_3-\text{CH}=\text{CH}-\text{CH}_3$ ?

- A) Neither may be polymerized  
B) Neither reacts with bromine to give 1,4-Dibromobutane  
C) Neither reacts with hydrogen to form butane  
D) Neither exhibits cis-trans isomerism

☐ A ☐ B ☐ C ☐ D

25) In elimination reaction there is another site present in the alkyl halide molecule where the attacking reagent (base) can attack at the same time. Such a site is an electrophilic hydrogen atom ( $\beta$ -hydrogen is acidic in nature) which is attached to the  $\beta$ -carbon of the alkyl halide. When the attack takes place on hydrogen we get an alkene there are two types of elimination reactions (E1 and E2):

Which of the following statements is incorrect about E2 elimination reaction?

| Opt. | E2 Elimination                                                                                                                                        |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| A)   |                                                                   |
| B)   | Rate of reaction = $k[\text{R-X}][\text{base}]$ it is bimolecular and shows second order kinetics                                                     |
| C)   | Order of ease of E2 elimination reaction in alkyl halides is<br>$3^\circ \text{ alkyl halide} > 1^\circ \text{ alkyl} > 2^\circ \text{ alkyl halide}$ |
| D)   | It completes in one step                                                                                                                              |

☐ A ☐ B ☐ C ☐ D

26) Consider the following statement about physical property of alkyl halide:

- I. Lower alkyl halides  $\text{CH}_3\text{Cl}$ ,  $\text{C}_2\text{H}_5\text{Cl}$  and  $\text{CH}_3\text{F}$  are gases at room temperature.
- II. Alkyl halides upto  $\text{C}_{18}$  are colorless liquids.
- III. Those beyond  $\text{C}_{18}$  are colourless solids.
- IV. They are usually insoluble in water due to their inability to form hydrogen bonding with water.

Which of the above statement is/are correct?

- A) I only C) III and IV only  
B) II only D) I, II, III and IV

☐ A ☐ B ☐ C ☐ D

27) In elimination reaction there is another site present in the alkyl halide molecule where the attacking reagent (base) can attack at the same time. Such a site is an electrophilic hydrogen atom ( $\beta$ -hydrogen is acidic in nature) which is attached to the  $\beta$ -carbon of the alkyl halide. When the attack takes place on hydrogen we get an alkene there are two types of elimination reactions (E1 and E2):

Which of the following statements is incorrect about E1



elimination reaction?

| Opt. | E1 Elimination                                                                                                                                                                                                                                                                                                                                          |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A)   | <p>Mechanism of reaction</p> <p>Rate of reaction = <math>k [R-X]</math> It is unimolecular and second order kinetics reaction</p> <p>Order of ease of E1 elimination reaction in alkyl halide is<br/> <math>2^\circ \text{ alkyl halide} &gt; 3^\circ \text{ alkyl halide} &gt; 1^\circ \text{ alkyl halide}</math></p> <p>It completes in two step</p> |
| B)   |                                                                                                                                                                                                                                                                                                                                                         |
| C)   |                                                                                                                                                                                                                                                                                                                                                         |
| D)   |                                                                                                                                                                                                                                                                                                                                                         |

- ☐ A ☐ B ☐ C ☐ D

28) Consider the following different between  $S_N1$  and  $S_N2$  reactions.

| $S_N1$                                                                                                                                                                                                                                  | $S_N2$                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>I. A two-step mechanism</p> <p>II. Rate depends only on concentration of alkyl halide.</p> <p>III. Is unimolecular</p> <p>IV. Rate depends on structure of halide<br/> <math>3^\circ &gt; 2^\circ &gt; 1^\circ &gt; CH_3X</math></p> | <p>A one-step mechanism</p> <p>Rate depends on concentration of alkyl halide and nucleophile.</p> <p>Is biomolecular</p> <p>Rate depends on structure of halide<br/> <math>CH_3X &gt; 1^\circ &gt; 2^\circ &gt; 3^\circ</math></p> |

Which of the above statement is/are correct?

- A) I only  
 B) II only  
 C) III and IV only  
 D) I, II, III and IV

- ☐ A ☐ B ☐ C ☐ D

29) Which one of the following halides is most reactive towards nucleophilic substitution reaction?

- A)  $C_2H_5Br$   
 B)  $C_2H_5F$   
 C)  $C_2H_5I$   
 D)  $C_2H_5Cl$

- ☐ A ☐ B ☐ C ☐ D

30) All electron deficient species are classified as:

- A) Nucleophiles  
 B) Bases  
 C) Electrophiles  
 D) All of these

- ☐ A ☐ B ☐ C ☐ D

31) The carbon atom carrying positive charge and attached to three other atoms or groups is called:

- A) Carbonium ion  
 B) Oxonium ion  
 C) Carbon ion  
 D) Carbonion

- ☐ A ☐ B ☐ C ☐ D

## < WORKSHEET

### Chemistry

## ATTEMPTED MCQS 31/31



1) The type of alkyl halides in which halogen is attached with such C-atom which is further attached with two C-atoms are called?

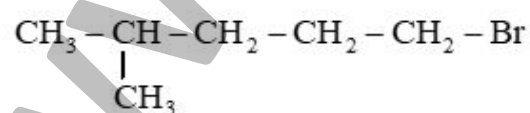
- A) 1° alkyl halides                      C) 3° alkyl halides  
B) 2° alkyl halides                      D) 4° alkyl halides

A ☐ B ☐ C ☐ D

Your answer is incorrect



2) Consider the following structure formula of alkyl halide:

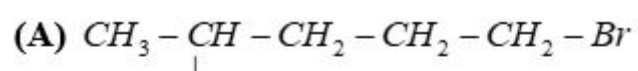


The correct name according to IUPAC is:

- A) 1-Bromo-4-methylpentane  
B) 2-Methyl-5-bromopentane  
C) 2-Methyl-1-bromopentane  
D) 2-Methyl-2-bromopentane

A ☐ B ☐ C ☐ D

Your answer is correct





According to IUPAC the correct name of the given structure is **1-Bromo-4-methylpentane**.

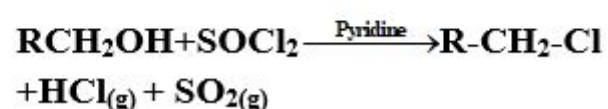
3) Which of the following is the best method to prepare alkyl halides?

- A) Reaction of alcohol with HCl in the presence of catalyst  $\text{ZnCl}_2$
- B) Reaction of alcohol with  $\text{PCl}_5$
- C) Reaction of alcohol with  $\text{PCl}_3$
- D) Reaction of alcohol with  $\text{SOCl}_2$  in the presence of pyridine solvent

A ☐ B ☐ C ☐ D

Your answer is incorrect

(D) This is the best method to prepare **alkyl halides** because the side products in this reaction are in the gaseous state



4) Which of the following alkyl halides cannot be prepared by the direct halogenation of alkanes?

- A)  $\text{R-Cl}$
- B)  $\text{R-Br}$
- C)  $\text{R-I}$
- D)  $\text{R-F}$

A ☐ B ☐ C ☐ D

Your answer is incorrect

(C) Order of reactivity of **halogens** with **alkane** is as follow  $\text{F}_2 > \text{Cl}_2 > \text{Br}_2 > \text{I}_2$ . This order shows that  $\text{I}_2$  is **least reactive** and it **does not react** with **alkane** to form **alkyl halide**. It is clear that  $\text{R-I}$  **cannot** be prepared from **alkane**.

5) Which of the following is good leaving group?

- A)  $\text{NH}_2^-$
- B)  $\text{HSO}_4^-$
- C)  $\text{OR}^-$
- D)  $\text{OH}^-$

A ☐ B ☐ C ☐ D

Your answer is incorrect

(B)

| Good Leaving Group                                                | Poor Leaving Group                                |
|-------------------------------------------------------------------|---------------------------------------------------|
| $\text{Cl}^-$ , $\text{Br}^-$ , $\text{I}^-$ and $\text{HSO}_4^-$ | $\text{OH}^-$ , $\text{OR}^-$ and $\text{NH}_2^-$ |
| Less polar                                                        | More polar                                        |
| Low bond energy                                                   | Greater bond energy                               |



|                    |                    |
|--------------------|--------------------|
| Give fast reaction | Give slow reaction |
|--------------------|--------------------|

6) Which of the following statements is not correct for  $S_N2$  mechanism reaction?

- A) It is bimolecular, 2<sup>nd</sup> order reaction
- B) Order of ease of  $S_N2$  mechanism in alkyl halide is 1° alkyl halide > 2° alkyl halide > 3° alkyl halide
- C) It takes place in the presence of polar solvent
- D) It involves 100% inversion in the products

A ☐ B ☐ C ☐ D

Your answer is incorrect

(C)  $S_N2$  mechanism reaction takes place in the presence of **non-polar solvent** such as **n-hexane** not in the presence of **polar solvent** (e.g.  $H_2O$ ).

7) Mark the incorrect statement about alkyl halide:

- A) Boiling points of haloalkanes are greater than that of alkanes
- B) Order of decreasing boiling points in alkyl halides is  $R-I > R-Br > R-Cl > R-F$
- C) Alkyl halides are soluble in water
- D) Primary alkyl halides can be prepared by reaction of  $PCl_5$  or  $SOCl_2$  with alcohols but not aryl halide

A ☐ B ☐ C ☐ D

Your answer is incorrect

(C) Alkyl halides are soluble in **non-polar solvent**.

8) Which of the following halide ion ( $X^-$ ) is good nucleophile and good leaving group?

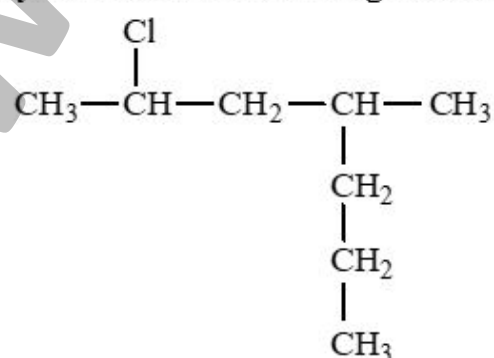
- A)  $I^-$
- B)  $Cl^-$
- C)  $F^-$
- D)  $Br^-$

A ☐ B ☐ C ☐ D

Your answer is correct



9) Which one of the following is the correct name according to IUPAC system for the formula given below?



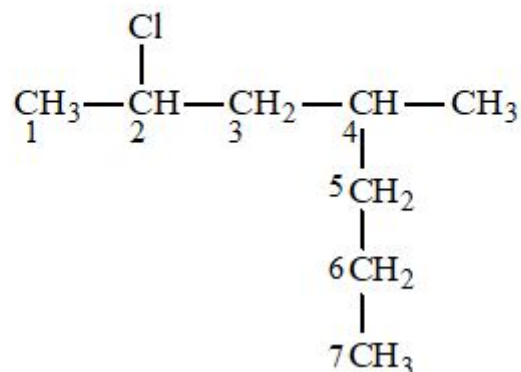
- A) 4-Methyl-6-chloroheptane
- B) 2-Chloro-4-methylheptane
- C) 2-Chloro-4-n propylhexane

D) 2-Chloro-4-n propylpentane

A ☐ B ☐ C ☐ D

Your answer is incorrect

(B) The correct name according to IUPAC of the given structure is 2-Chloro-4-methylheptane.



10) CCl<sub>4</sub> has all of the following characteristic features EXCEPT:

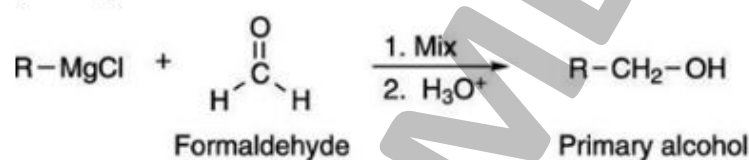
- A) It is colourless liquid
- B) It is used as industrial solvent
- C) It is insoluble in water and soluble in alcohol for fat, oil etc
- D) It is inflammable

A ☐ B ☐ C ☐ D

Your answer is incorrect

(D) CCl<sub>4</sub> is non-polar and is non-flammable.

11) Considered the following reaction of Grignard reagent with methanal (a carbonyl compound) followed by hydrolysis:



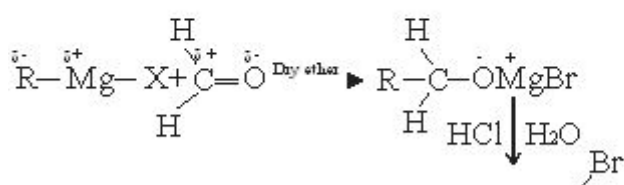
The mechanism of reaction before hydrolysis is:

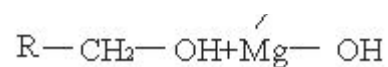
- A) Electrophilic addition reaction
- B)  $\beta$ -elimination
- C) Nucleophilic addition reaction
- D) Nucleophilic substitution reaction

A ☐ B ☐ C ☐ D

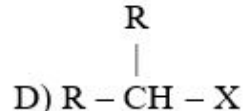
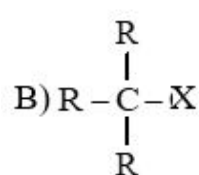
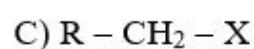
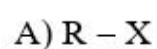
Your answer is incorrect

(C) Mechanism of reaction in the formation of intermediate product before hydrolysis is nucleophilic addition reaction as shown below. Others A, B, and D are not related.





- 12) Which of the following type of alkyl halide is the most reactive w.r.t  $S_N1$ .



A ☐ B ☐ C ☐ D

Your answer is incorrect

(B)

- 13) Alkyl halides are considered to be very reactive compounds towards nucleophiles because:

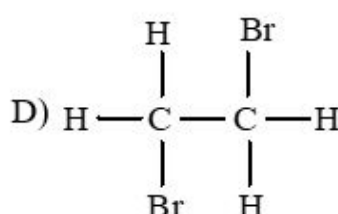
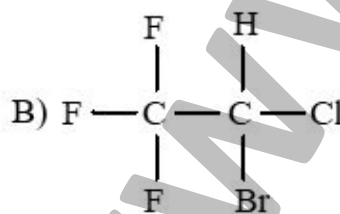
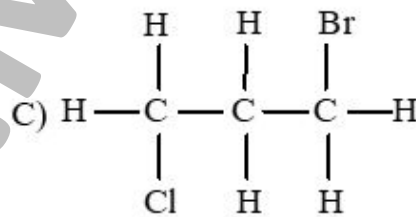
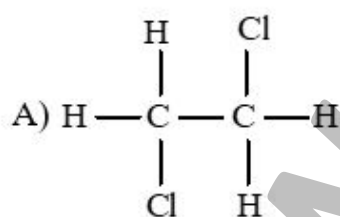
- A) They have an electrophilic carbon  
 B) They have an electrophilic carbon and a good leaving group  
 C) They have an electrophilic carbon and bad leaving group  
 D) They have a nucleophilic carbon and a good leaving group

A ☐ B ☐ C ☐ D

Your answer is incorrect

- (B) Alkyl halides are considered to be very reactive compounds towards nucleophiles because they have an electrophilic carbon and a good leaving group.

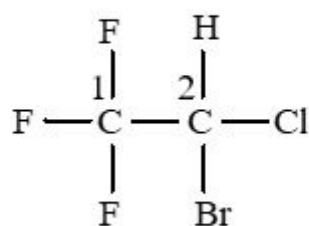
- 14) Which one of the followings is Halothane?



A ☐ B ☐ C ☐ D

Your answer is incorrect

- (B) The structure of halothane is given below:





15) Identify the incorrect statement about the use of chloroform:

- A) It is used as an anesthetic substance
- B) It is used as a solvent for fats waxes and resins
- C) It is used in manufacturing freons
- D) It is used as preservative for anatomical specimen

A ☐ B ☐ C ☐ D

Your answer is incorrect

(C) A, B and D are the uses of chloroform except C.

16) All of the following are characteristic features of Teflon plastic EXCEPT:

- A) It is valuable plastic which resists the action of acid and alkali
- B) It is used as coating the electrical wiring
- C) It is used as a non-stick coating for cooking pans
- D) It reacts with oxidants

A ☐ B ☐ C ☐ D

Your answer is incorrect

(D) Teflon plastic not only reacts with acid and alkali but also it reacts with oxidant.

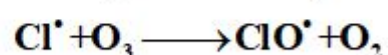
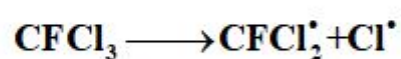
17) Which of the following is the most dangerous factor which damages ozone?

- A) Aerosol spray
- B) Use of chlorofluorocarbons
- C) Effect of SO<sub>2</sub> and NO<sub>2</sub> pollutant
- D) Global warming by CO<sub>2</sub>

A ☐ B ☐ C ☐ D

Your answer is incorrect

(B) Use of chlorofluorocarbons is the most dangerous for ozone layer. Chlorofluorocarbons used as refrigerants in air conditioning and in aerosol sprays are inert in the troposphere but slowly diffuse into stratosphere, where they are subjected to ultraviolet radiation generating Cl<sup>•</sup> free radicals. Chlorofluorocarbons (CFCs) play an effective role in removing O<sub>3</sub> in the stratosphere due to following reactions.



18) Grignard reagent is reactive due to:

- A) The presence of halogen atom
- B) The polarity of C – Mg bond
- C) The presence of Mg atom
- D) The polarity of C – X bond

A ☐ B ☐ C ☐ D

Your answer is incorrect

(B) The greater reactivity of Grignard's reagent is due to the polarity of  $\alpha$ -carbon and Mg bond (the electronegativity of C = 2.5, Mg = 1.2 and the difference is 1.3 so C – Mg bond is polar). The  $\alpha$ -carbon develops the partial negative charge and acts as nucleophilic centre  $R^{\delta-} - Mg^{\delta+} - X$ .

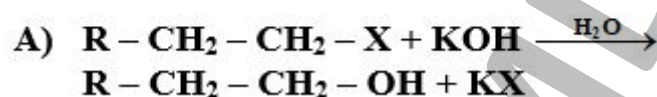
19) In which of the following reactions alcohol is produced?

- A) Reaction of alkyl halide with aqueous KOH
- B) Reaction of alkyl halide with alcoholic KOH
- C) Reaction of alkyl halide with KCN followed by acidic hydrolysis
- D) Reactions of alkyl halide with sodium alkoxide

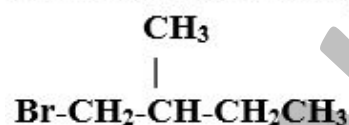
A ☐ B ☐ C ☐ D

Your answer is correct

(A) As a reaction of alkyl halide with aqueous KOH, alcohol is formed as shown in the reactions:



20) Consider the following structure of alkyl halide:



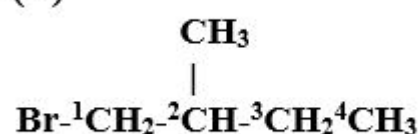
Which of the following correct name of given structure according to IUPAC system is:

- A) 1-Bromo-2-methylbutane
- B) 4-Bromo-3-methylbutane
- C) 4-Bromo-2-methylbutane
- D) 1-Bromo-3-methylbutane

A ☐ B ☐ C ☐ D

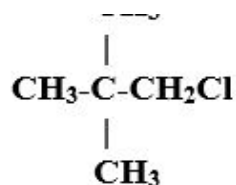
Your answer is correct

(A)



21) Consider the following structure of alkyl halide:





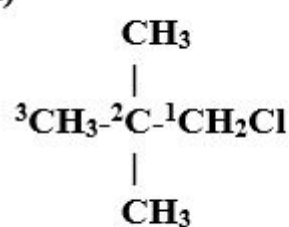
Which of the following correct name of given structure according to IUPAC system is:

- A) 3-Chloro-2,2-dimethylpropane  
 B) 1-Chloro-2,2-dimethylpropane  
 C) 2-Chloro-2,2-dimethylpropane  
 D) 1-Chloro-2,3-dimethylpropane

A ☐ B ☐ C ☐ D

Your answer is incorrect

(A)



1-Chloro-2,2-dimethylpropane

22) Which of the following correct statement about substrate and leaving group?

- A) The molecule which undergoes nucleophilic substitution reaction is called substrate  
 B) The group are species which leaves the substrate is called leaving group (nucleofuge)  
 C) Both A and B  
 D) Neither A nor B

A ☐ B ☐ C ☐ D

Your answer is incorrect

(C)

- The molecule which undergoes nucleophilic substitution reaction is called substrate
- The group are species which leaves the substrate is called leaving group (nucleofuge)

23) Which of the following carbocation is most stable?

- A)  $(\text{CH}_3)_3\text{C-C}^+\text{H}_2$  C)  $\text{CH}_3\text{CH}_2\text{C}^+\text{H}_2$   
 B)  $(\text{CH}_3)_3\text{C}^+$  D)  $\text{CH}_3\text{C}^+\text{HCH}_2\text{CH}_3$

A ☐ B ☐ C ☐ D

Your answer is incorrect

(B)  $(\text{CH}_3)_3\text{C}^+$  carbocation is most stable.

24) Which one of the following is a correct statement about the two alkenes





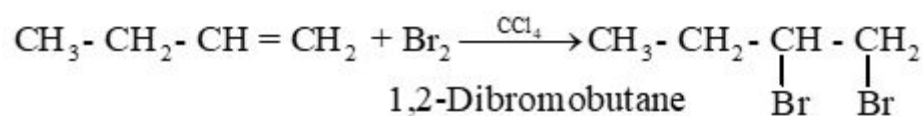
- A) Neither may be polymerized  
 B) Neither reacts with bromine to give 1,4-Dibromobutane  
 C) Neither reacts with hydrogen to form butane  
 D) Neither exhibits cis-trans isomerism

A ☐ B ☐ C ☐ D

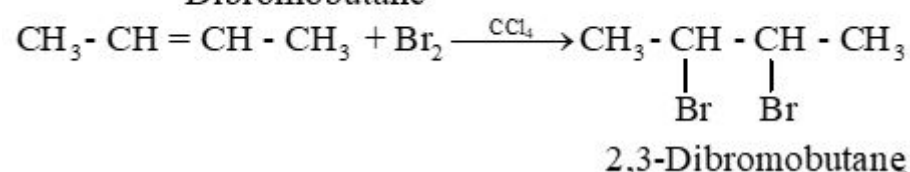
Your answer is incorrect

(B)

- 1-Butene and 2-Butene do not give 1,4-Dibromobutane on bromination as shown in the reactions.
- 1-Butene on bromination gives 1,2-Dibromobutane.



- 2-Butene on bromination gives 2,3-Dibromobutane



- 25) In elimination reaction there is another site present in the alkyl halide molecule where the attacking reagent (base) can attack at the same time. Such a site is an electrophilic hydrogen atom ( $\beta$ -hydrogen is acidic in nature) which is attached to the  $\beta$ -carbon of the alkyl halide. When the attack takes place on hydrogen we get an alkene there are two types of elimination reactions (E1 and E2):  
 Which of the following statements is incorrect about E2 elimination reaction?

| Opt. | E2 Elimination                                                                                                                                        |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| A)   | <p style="text-align: center;">Bromoethane <span style="margin-left: 100px;">Ethene</span></p>                                                        |
| B)   | Rate of reaction = $k[\text{R-X}][\text{base}]$ it is bimolecular and shows second order kinetics                                                     |
| C)   | Order of ease of E2 elimination reaction in alkyl halides is<br>$3^\circ \text{ alkyl halide} > 1^\circ \text{ alkyl} > 2^\circ \text{ alkyl halide}$ |
| D)   | It completes in one step                                                                                                                              |

A ☐ B ☐ C ☐ D

Your answer is incorrect

- (B) It is incorrect statement. The correct statement is as follow:

|    |                                                                                                                                                       |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| C) | Order of ease of E2 elimination reaction in alkyl halides is<br>$1^\circ \text{ alkyl} > 2^\circ \text{ alkyl halide} > 3^\circ \text{ alkyl halide}$ |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------|

- 26) Consider the following statement about physical property of alkyl halide:

- I. Lower alkyl halides  $\text{CH}_3\text{Cl}$ ,  $\text{C}_2\text{H}_5\text{Cl}$  and  $\text{CH}_3\text{F}$  are gases at room temperature.
- II. Alkyl halides upto  $\text{C}_{18}$  are colorless liquids.
- III. Those beyond  $\text{C}_{18}$  are colourless solids.
- IV. They are usually insoluble in water due to their

iv. They are usually insoluble in water due to their inability to form hydrogen bonding with water.

Which of the above statement is/are correct?

- A) I only  
B) II only  
C) III and IV only  
D) I, II, III and IV

A ☐ B ☐ C ☐ D

Your answer is incorrect

(B) Physical property of alkyl halide are:

- I. Lower alkyl halides  $\text{CH}_3\text{Cl}$ ,  $\text{C}_2\text{H}_5\text{Cl}$  and  $\text{CH}_3\text{F}$  are gases at room temperature.
- II. Alkyl halides upto  $\text{C}_{18}$  are colorless liquids.
- III. Those beyond  $\text{C}_{18}$  are colourless solids.
- IV. They are usually insoluble in water due to their inability to form hydrogen bonding with water.

- 27) In elimination reaction there is another site present in the alkyl halide molecule where the attacking reagent (base) can attack at the same time. Such a site is an electrophilic hydrogen atom ( $\beta$ -hydrogen is acidic in nature) which is attached to the  $\beta$ -carbon of the alkyl halide. When the attack takes place on hydrogen we get an alkene there are two types of elimination reactions (E1 and E2): Which of the following statements is incorrect about E1 elimination reaction?

| Opt. | E1 Elimination                                                                                                                                           |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| A)   | <p>Mechanism of reaction</p>                                                                                                                             |
| B)   | Rate of reaction = $k [\text{R-X}]$ It is unimolecular and second order kinetics reaction                                                                |
| C)   | Order of ease of E1 elimination reaction in alkyl halide is $2^\circ \text{ alkyl halide} > 3^\circ \text{ alkyl halide} > 1^\circ \text{ alkyl halide}$ |
| D)   | It completes in two step                                                                                                                                 |

A ☐ B ☐ C ☐ D

Your answer is incorrect

(C) It is incorrect statement. The correct statement is as follow:

Order of ease of E1 elimination reaction in alkyl halide is  $3^\circ \text{ alkyl halide} > 2^\circ \text{ alkyl halide} > 1^\circ \text{ alkyl halide}$

- 28) Consider the following different between  $\text{S}_\text{N}1$  and  $\text{S}_\text{N}2$  reactions.

| $\text{S}_\text{N}1$                                    | $\text{S}_\text{N}2$                                           |
|---------------------------------------------------------|----------------------------------------------------------------|
| I. A two-step mechanism                                 | A one-step mechanism                                           |
| II. Rate depends only on concentration of alkyl halide. | Rate depends on concentration of alkyl halide and nucleophile. |

|                                                                                                                                      |                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>III.</b> Is unimolecular<br><b>IV.</b> Rate depends on structure of halide<br>$3^\circ > 2^\circ > 1^\circ > \text{CH}_3\text{X}$ | Is biomolecular<br>Rate depends on structure of halide<br>$\text{CH}_3\text{X} > 1^\circ > 2^\circ > 3^\circ$ |
|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|

Which of the above statement is/are correct?

- A) I only  
 B) II only  
 C) III and IV only  
 D) I, II, III and IV

A ☐ B ☐ C ☐ D

Your answer is incorrect

(D)

| $\text{S}_{\text{N}}1$                                                                                                                                                                                                                                                                                                                   | $\text{S}_{\text{N}}2$                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1.</b> A two-step mechanism<br><b>2.</b> Rate depends only on concentration of alkyl halide.<br><b>3.</b> Is unimolecular<br><b>4.</b> Rate depends on structure of halide<br>$3^\circ > 2^\circ > 1^\circ > \text{CH}_3\text{X}$<br><b>5.</b> Reaction is favoured by polar solvents<br><b>6.</b> Reaction can occur with weak bases | <b>1.</b> A one-step mechanism<br><b>2.</b> Rate depends on concentration of alkyl halide and nucleophile.<br><b>3.</b> Is biomolecular<br><b>4.</b> Rate depends on structure of halide<br>$\text{CH}_3\text{X} > 1^\circ > 2^\circ > 3^\circ$<br><b>5.</b> Reaction is favoured by non-polar solvents<br><b>6.</b> Reaction requires strong bases. |

29) Which one of the following halides is most reactive towards nucleophilic substitution reaction?

- A)  $\text{C}_2\text{H}_5\text{Br}$   
 B)  $\text{C}_2\text{H}_5\text{F}$   
 C)  $\text{C}_2\text{H}_5\text{I}$   
 D)  $\text{C}_2\text{H}_5\text{Cl}$

A ☐ B ☐ C ☐ D

Your answer is incorrect

(C)  $\text{C}_2\text{H}_5\text{I}$  halides is most reactive towards nucleophilic substitution reaction.

30) All electron deficient species are classified as:

- A) Nucleophiles  
 B) Bases  
 C) Electrophiles  
 D) All of these

A ☐ B ☐ C ☐ D

Your answer is incorrect

(C) All electron deficient species are classified as electrophiles.

31) The carbon atom carrying positive charge and attached to three other atoms or groups is called:



A) Carbonium ion

C) Carbon ion

B) Oxonium ion

D) Carbonion

A

☐ B

☐ C

☐ D

Your answer is correct

- (A) The carbon atom carrying positive charge and attached to three other atoms or groups is called carbonium ion.

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